The effect of extra-oral suction on aerosol reduction

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INTRODUCTION: Aerosols are generated during dental procedures with a high-speed handpiece and an ultrasonic scaler. These modern dental instruments has led to increases in aerosol generation in dental clinics. Extra-oral suction has been utilized as a aerosol control measure in dental care settings, but there are few clinical reports on its effectiveness. This study was conducted to evaluate the effect of extra-oral suction on aerosol reduction.

METHODS: This study included a 65 year-old male patient scheduled for undergoing periodontal scaling who consented to participate in the study. Subgingival scaling was performed for buccal and lingual pockets. Areas undergoing periodontal scaling is one side on the maxillary first incisor , second incisor and canine and another side on the mandibular second premolar, first molar and second molar, using an intra-oral suction device alone on the left side and both intra- and extra-oral devices on the right side. The number of bacteria in the periodontal pockets are almost same between the right side and the left side. The extra-oral suction system used in the study was Free Arm Forte-S (Tokyo Giken Co., Ltd). The suction system was operated for 3 minutes during subgingival scaling. The suction head was positioned 5cm from the treatment site at 45 degrees to the floor surface. The level of aerosol with intra-oral suction alone and with intra- and extra-oral suction combined was measured with Hach Ultra Analytics Met One Laser Particle Counter and the counts of bacterial colony with GSI Creos Basic Air.

Scaling areas

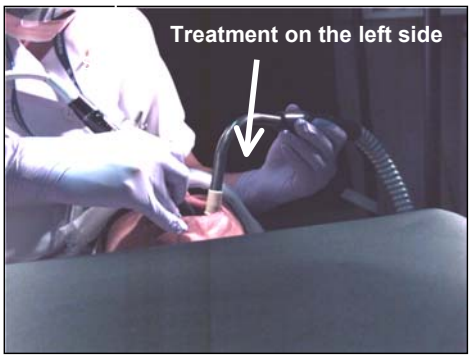
The maxillary first incisor , second incisor and canine

The mandibular second premolar, first molar and second molar

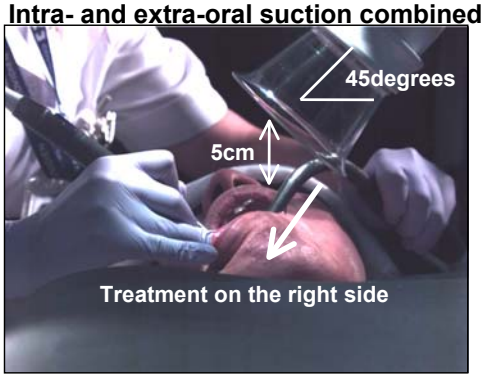
Particle Counter and GSI Creos Basic Air

Free Arm Forte-S

Intra-oral suction alone

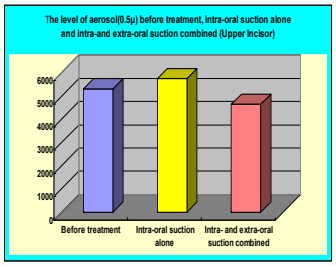


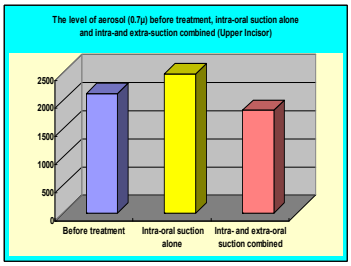
Intra- and extra-oral suction combined

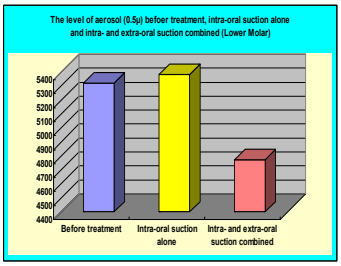


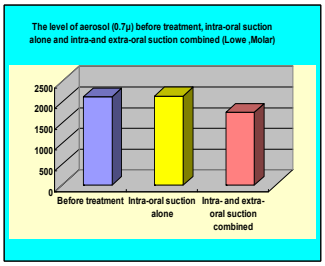
RESULTS:

The level of aerosol with intra-oral suction alone and with intra- and extra-oral suction combined

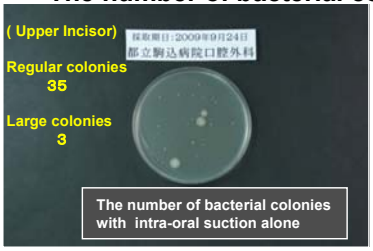


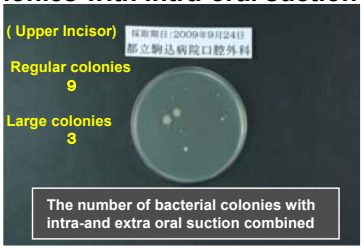


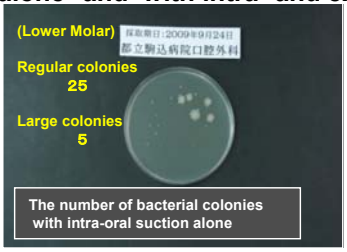


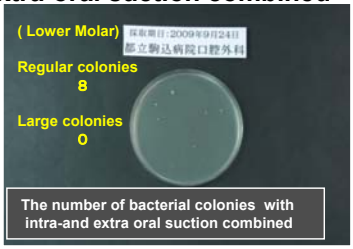


The number of bacterial colonies with intra-oral suction alone and with intra- and extra-oral suction combined









CONCLUSIONS: The combined use of intra- and extra-oral suction devices resulted in lower level of aerosol and bacterial colony , suggesting the benefit of installing an extra-oral suction device for aerosol reduction during dental treatment.